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ABSTRACT

The effects of five verbal elaboration conditions on the paired associate learning of 50 elementary-aged educable mentally retarded children were investigated. Four of the conditions, crossing functional and positional relations in familiar or unfamiliar events, were included in a two-factor design (type of relation x familiarity); the fifth (nonsense condition) was included as an outside control. Ten Ss were tested in each condition. The dominant finding was a significant interaction between type of relation and familiarity, with positional-unfamiliar elaborations being the least effective in the two-factor design. The nonsense condition produced the poorest performance levels across the five conditions, especially for Ss identified as being more severely retarded. (Author)

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FAMILIARITY AND RELATIONAL EFFECTS IN VERBAL ELABORATION

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Abstract

The effects of five elaboration conditions on the paired-associate learning of educable mentally retarded children were investigated. Four of the conditions, crossing functional and positional relations in familiar or unfamiliar events, were included in a two-factor design (Type of Relation X Familiarity); the fifth (Nonsense condition) was included as an outside control. Ten elementary-aged children were tested in each condition. The dominant finding was a significant interaction between type of relation and familiarity, with Positional-Unfamiliar elaborations being the least effective in the two-factor design. The Nonsense condition produced the poorest performance levels across the five conditions, especially for subjects identified as being more severely retarded.

Familiarity and Relational Effects in Verbal Elaboration

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Impressive facilitation of paired-associate learning occurs when the items to be learned are presented within verbal elaborations (e.g., sentences). Although the effectiveness of embedding noun pairs in various types of verbal elaborations has often been demonstrated (cf. Jensen & Rohwer, 1963; MacMillan, 1970; Milgram, 1968; Turnure, 1971; Turnure & Walsh, 1971), theoretical ambiguities concerning the basis for the facilitative effects of verbal elaborations remain (Davidson, Perry, & Baker, 1974). Clarification of the specific characteristics of verbal elaborations which made them effective for children of various abilities would not only be important theoretically, but also would provide a valuable basis for developing instructional materials and training procedures for young and mentally retarded children.

Familiarity is a factor which has long been stressed by educators (Elliott, 1970), and which may be important in determining the effectiveness of verbal elaborations. The effectiveness of an elaboration is very likely influenced by its familiarity to the child. One may hypothesize that the degree to which a communication provides connections to things familiar or known to a child will also be directly related to the quality of that elaboration for that particular child. This factor might prove to be an extremely important one in regard to the education of the EMR child, whose range of experiences is generally more limited than that of the nonretarded child (Jordan, 1962).

The relational characteristics of an elaboration comprise a second factor which may play an important part in determining an elaboration's effectiveness. Initially, grammatical relations and surface structure factors were posited in attempts to explain the basis of the observed facilitation resulting from elaborations (Rohwer, 1966; Rohwer & Levin, 1968; Rohwer & Lynch, 1966, 1967; Suzuki & Rohwer, 1968, 1969; cf. Turnure & Thurlow, Note 1). More recently, it has been suggested that the formation of semantic relations is of primary importance in determining the effectiveness of an elaboration (cf. Ehri & Richardson, 1972; Ehri & Rohwer, 1969; Thurlow & Turnure, 1972; Turnure, 1971; Turnure & Thurlow, 1973a). In fact, after a decade of research on verbal elaboration, Rohwer (1973) defined an elaboration in relational terms: "At a minimum, an [elaborative event] is conceived to consist of two objects (or, more abstractly, topics) and some episode, process, or relation involving both of them, either explicitly or by implication or by entailment" (p. 5). Even with the growing recognition of the central role of some type of relational quality on the facilitation from elaborations, there have been only a few attempts to investigate the nature or function of this quality on the ability of an elaboration to facilitate learning.

The definition of a semantic relation is indeed more difficult than the definition of a grammatical relation, and it is probably for this reason that the investigation of the effects of semantic relations has been slow. One of the first attemps to investigate

the relational[1] characteristics of effective elaborations was made by Milgram (1968). Milgram proposed that there were four types of relations that could be expressed in elaborations, and he was able to categorize elaborations generated by educable mentally retarded (EMR), trainable mentally retarded (TMR), and nonretarded children on the basis of his four types. The four types of relations proposed by Milgram, presented in order from that expected to be least effective to that expected to be most effective, were: Nonsensical (e.g., the bird eats the train), b) Positional (e.g., the bird is on the train), c) Functional (e.g., the bird flies over the train), and d) Original or Novel (e.g., the engineer in the train caught a bird in a cage). In examining the relationship between these types of relations and performance levels, no differences were found. In other words, nonsensical relations were just as effective as functional relations, and so on. In addition, both TMRs and EMRs generated the same types of elaborations as the nonretarded children.

In interpreting the results of Milgram's (1968) study, it is important to note that, altogether aside from questions of his scoring procedures, he was examining the elaborations generated by the subjects themselves. Personally generated "commentaries" on pairs of items may possess commonalities that are not captured by arbitrary category partitions. Also, the ability of young children and retarded individuals to "spontaneously" produce effective elaborations has been questioned, leading to a production deficiency hypothesis (Flavell, 1970). This hypothesis postulates that, while these individuals are able to use ready-made mediators, their deficiencies in generating them consistently

makes for inefficient performance, a factor which also might mask category differences. This is relevant here since Milgram's subjects were instructed to generate sentences on second and third lists after some had been trained on list 1 and some not, providing for numerous confoundings. Therefore, it seemed plausible that in order to more appropriately judge the effects of different types of elaborations, they should be investigated under conditions that are both effective and controllable, such as when the experimenter provides the elaboration to the subjects.

In studies using experimenter-supplied sentences, investigators have found that certain types of elaborations result in better performances than others. For example, declaratives are better than conjunctives (Davidson, 1964; Rohwer, 1966), and normal sentences are better than anomolous or nonmeaningful ones (Rohwer, 1966; Rohwer & Levin, 1968). Other studies have found that elaborational effectiveness varies positively with the number of relations (separate associations) between the stimulus and response items (Turnure & Thurlow, 1973a; Gettinger, Note 2). Most notably, Rohwer, Lynch, Suzuki and Levin (1967) demonstrated that verb connectives produced learning superior to prepositional connectives, somewhat contrary to Milgram's findings. However, the Rohwer et al. finding of prepositional-verb differences was also at variance with some of Rohwer's previous work (Rohwer, 1966; Rohwer & Lynch, 1967) which had found little difference between verb and preposition connectives using printed nouns rather than pictures, suggesting the need for further research. Also, in our previous work on number of relations connecting item pairs, we noted that in formulating our

extended elaborations we often constructed action/locatives, such as "The turtle crawled into the basket so he could sleep there, but then he couldn't get out" (Turnure & Thurlow, 1973a, p. 83). Because of the previously mentioned empirical discrepancies, and so that we could begin sorting out apparent confoundings of different relational elements in our own work, we decided to compare, following Milgram, Functional and Positional relations.

In our previous work we had defined a "relation" as a separate link, connection, or association between stimulus and response items (Turnure & Thurlow, 1973a). In effect a relation corresponded to an "event" serving as a common referent for both items. Milgram (1968) identified a positional relationship as a spatial relationship usually including an intransitive verb along with an obligatory preposition (Note: Rohwer, et al. (1967) did not provide his prepositional connective with the copula, or in any other way make a complete sentence). A functional relationship expressed a commonly occurring life experience, presumably actional in nature.

The specific reference to "commonly occurring life experiences" in Milgram's functional relations is reminiscent of educators' insistence on familiarity, as mentioned previously. Review of previously utilized elaborations in our own work, and others suggested that, by some definition or another, commonly experienced or familiar "events" were variously interposed or confounded with uncommon or unfamiliar seeming ones. An effort was made to begin to try to sort out such a dimension in the present study, based on the assignment of response items according to the suitability of their obvious physical character-

istics to intersect the "operating characteristics" articulated to express the function or location of the stimulus term with which they were paired in simple declarative sentences. A condition reflecting Milgram's category of Nonsensical elaborations was also included in the study.

The present study involved a two factor design to investigate the effects of familiarity and type of relation, with an outside control to provide a performance baseline. Five elaboration types were examined: Functional-familiar, Functional-unfamiliar, Positional-familiar, Positional-unfamiliar, and Nonsense. Besides the acquisition data, reversal data were gathered as part of a continuing investigation of the relation of backward associations to meaningful learning (Turnure & Thurlow, 1973b.

Method

Subjects

Fifty EMR children from an urban public school system were employed as subjects. Half were from special classrooms within regular public schools, and half were from a special school serving only retarded children (EMR and TMR). Administrative assignment to the two types of schools was determined mainly through an assessment of the child's potential for return to a regular classroom. Children within the special classes in the regular public schools were believed to be more likely to move back into regular classes than were children in the school serving only retarded children.

Ten children (five children from each type of school) were randomly assigned to each of the five conditions in the present study. Analysis

of IQ, CA, and MA data indicated significant differences between the two population groups, with the subjects in the regular schools being older (Sp class $\overline{X}$ = 119.72 mos; Sp school $\overline{X}$ = 109.60 mos) and having higher MAs (Sp class $\overline{X}$ = 84.52; Sp school $\overline{X}$ = 70.96) and IQs (Sp class $\overline{X}$ = 70.52; Sp school $\overline{X}$ = 63.48) than the subjects in the special school.

Design

The effects of five experimental conditions were investigated. Four of the conditions were included in a two-factor design; the fifth was included as an outside control condition.

In the present study, the general definition of a relation was somewhat refined by adopting a perception-based conceptualization of the elements involved. Thus, an item assigned to the stimulus category was studied to identify some aspect or attribute which exemplified what could be called, after J. J. Gibson (1966), an "affordance property" of the thing (item). Such an affordance property was expressed as an action characteristic in our formulation of a functional relation, or as a tangible attribute delimiting spatial localizability for positional relations. For example, a pig, which was one of our items, can be seen to possess the capability for eating, which is the action characteristic we assigned to it. It obviously has other action capabilities, any one of which, during training, we could have asserted it was engaging in, for instance "squashing." But, it does not, in any normal sense, possess the ability to engage in "shouting" actions, as most people would interpret that word. The positional relation posed a peculiar and perplexing problem since virtually every object in existence is, in principle, unrestricted in regard to locational speci-

fication. That is, the standard prepositions can be applied to any object, or put the other way, any object (including a pig) can be said, virtually at any and all times to be in, on, under, by, or next to something else, which is to say prepositions are inherently relational. Therefore, a stimulus item's positional relation was established in conjunction with its response term so that sensible delimitations or physical localizability would not be violated (e.g., the pig could not be in a gun).

Familiarity was manipulated by assignment of response items, and was a judgment by the experimenter, partially conditioned by local conditions of experience (e.g., a broom could be sweeping snow, or just be by a snowman in Minnesota, and be familiar, but such relations would be obviously unfamiliar in, say, Louisiana, and such relations might even be incomprehensible in parts of Africa), and further influenced by the experimenter's experience with and knowledge of the type of childrer selected for study.

Elaborations in the Functional-familiar condition presented familiar functional relations (specified actions or activities) between the subjects and objects (e.g., the key is opening the door; the pig is eating the carrots). A Functional-unfamiliar elaboration presented a functional relation between the subject and object that would not be commonly thought of or seen (e.g., the key is opening the wagon; the pig is eating the basket). A Positional-familiar elaboration presented a familiar positional (a spatial description of location) relation between the subject and object (e.g., the key is the jacket; the pig is inside the barn). A Positional-unfamiliar elaboration presented a positional relation that

is not commonly thought of or seen (e.g., the key is in the chair; the pig is inside the window). The Nonsense condition elaborations contained functional relations that were inconsistent with experience, that violated lexical co-occurrence restrictions, and were not congruent with the perceptual affordance properties of the subject item (e.g., the key is jumping over the basket; the pig is shouting at the donuts).

The item pairs were then investigated for possible confoundings of association values. A review of Entwisle's (1966) association norms for children showed that of those items found in the norms, none of the response items paired with the stimuli in the present study had been given as associates of the items. It thus seemed unlikely that any differences found between conditions could be attributed to differential association strengths between items in the various conditions.

Materials

Experimental materials were colored pictures of common objects taken from a preprimer workbook and mounted on white cardboard (8.9 x 6.4 cm). Twelve pictures were stimulus items, with the selection being essentially random, except that each stimulus item had to be something that could perform some operation on or action to a second object.

Twenty-four pictures were response items. Twelve of the 24 pictures were used in the Functional-familiar condition and the other 12 in the Functional-unfamiliar condition. A different set of 12 pictures was used in the Positional-familiar condition, with the remaining 12 being used in the Positional-unfamiliar condition. The pairs in the Nonsense condition were formed by randomly selecting half the response items, and pairing them with the stimulus items. The functional rela-

tion established for each stimulus item was changed to be inconsistent with the possible functions of the stimulus item.

Procedure

Subjects were tested individually. Each testing session included pretraining, acquisition training, a test trial, and a reversal trial. Instructions for each phase of the testing session were the same for the five experimental conditions; only the stimulus and response pairs and their elaborations varied between conditions.

During pretraining, the child was told to look at the pictures he would be shown, to listen to what the experimenter said about them, and then to say the same thing himself. Practice was allowed with one pair (crayon - fan). The elaboration used for this pair varied only along the dimension of type of relation (Functional: The crayon is writing on the fan; Positional: The crayon is under the fan; Nonsense: The crayon is eating the fan).

Following pretraining, acquisition training began. The child was reminded of what he had just done, and was asked to continue doing the same thing. Following a random ordering which was constant across subjects, each of the 12 pairs of pictures was presented for 15 seconds, during which the experimenter was to utter the elaboration and the subject was to repeat it. Only a few subjects required more than 15 seconds to complete the repetition of the elaboration, and this occurred only with one or two pairs. In these cases, when 15 seconds had passed, the experimenter immediately removed the pictures from the child's view, but allowed him up to 15 additional seconds to complete his responding.

After all 12 pairs had been presented in this manner, the test trial began. During this trial, the child was shown only the stimulus item of each pair, in an established random order different from that used in the training trial, and for each item was asked to name the picture that "goes with it." A response interval of up to 20 seconds was allowed for each pair. After a response, or after 20 seconds, the child was briefly shown the stimulus and response pictures together before the next item was presented.

Upon conclusion of the test trial, the child was immediately presented with the reversal trial, without being informed of any change of procedure. During this trial, the subject was shown a response item, again in an order different from either training or acquisition, and was asked to name the picture that was paired with it (i.e., the stimulus). All 12 pairs were tested during the reversal trial, and timing procedures were the same as during the test trial.

Results

Acquisition

The mean numbers of correct responses made during the test trial and the reversal trial are presented in Table 1. Analysis of the number correct for just the four cells in the two-way replicated experiment design indicated that the type of relation factor, $F(1,32) = 5.75$, $p < .025$, and the interaction of relation type and familiarity, $F(1,32) = 6.87$, $p < .025$, were significant. The replication factor was not significant. A Newman-Keuls test on the four combined means revealed that the Functional-familiar, Functional-unfamiliar, and Positional-familiar

conditions had significantly higher means than the Positional-unfamiliar condition.

Insert Table 1 about here

The data in the table suggest that in the Nonsense condition the two groups of subjects did not perform comparably. A t test of the means for the subjects from the regular schools versus those from the special school confirmed this observation, $t(8) = 3.09$, $p < .05$. The children placed in schools containing only special classes performed significantly poorer in the Nonsense condition than did children in the regular schools. Because the two subject groups did perform significantly different in the Nonsense condition, comparisons of the Nonsense condition with the other groups were made using within subject group analyses. A one-way analysis of variance of the number correct for the children in the regular schools showed a significant condition effect, $F(4,20) = 3.91$, $p < .025$. A follow-up Newman-Keuls test indicated that the Nonsense and Positional-unfamiliar conditions were significantly different than the other conditions (all ps $< .05$), with subjects in the Nonsense and Positional-unfamiliar conditions getting an average of 4.3 fewer correct. A one-way analysis of variance revealed a significant condition effect for the special school children, $F(4,20) = 7.72$, $p < .001$. A Newman Keuls test showed that the Nonsense condition was different from the other four conditions (all ps $< .05$). In addition, the Positional-unfamiliar condition subjects performed at a level significantly lower than those in the Functional-unfamiliar condition ($p < .05$).

Reversal

Analysis of just the four cells in a two-way replicated design indicated that the interaction of the type of relation factor and the familiarity factor was significant, $F(1,32) = 4.95$, $p < .05$. The replication factor was not significant. A Newman-Keuls test on the four combined means failed to identify any of the differences between means as significant.

Observation of Table 1 suggests that the two subject groups performed comparably in all conditions, possibly excepting the Nonsense condition. A t test of the Nonsense condition means for subjects from the regular schools versus those from the special school, however, indicated that the difference was not significant, $t(8) = 2.12$. When the two school groups in the Nonsense condition were combined and compared with the other four conditions in a one-way analysis of variance, the condition factor was significant, $F(4,45) = 9.08$, $p < .001$. A Newman-Keuls test on the means indicated that the performance in the Nonsense condition was significantly poorer than in the Functional-familiar, Positional-familiar, and Functional-unfamiliar conditions (all $ps < .01$); no other significant differences were found.

Discussion

The results of the present study indicate that familiarity and the type of relation have some influence on elaborational effectiveness. Most clearly, in the absence of a coherent, meaningful and familiar relation within an elaboration (as in the Nonsense condition) learning is reduced. This was evident from the results of both the acquisition

task and the reversal task, and was especially true for the students from the special school population. Apparently, although the sentences in the Nonsense condition contained identifiable relations (e.g., "talking to," "running after"), the nonsensical implications (i.e., affordance property incongruity) of the specific events reduced the effectiveness of the elaborations to a level at or below that of providing no associative bond between the stimulus and response (cf. Milgram, 1968; Turnure, 1971; Turnure & Walsh, 1968) at least for the special school population.

Early attempts to look at meaningfulness in elaborations investigated the effects of strings of nonsense words as compared to English word strings (Rohwer, 1966). The finding that nonsense strings (e.g., the ludding cow drases the spraking ball) did not facilitate paired-associate learning was quite clear. In the present study, the Nonsense condition was used as a baseline condition in which semantic inappropriateness was determined by the subject of the sentence--functional relations were inconsistent with experience, violated lexical co-occurrence restrictions, and did not cohere with the perceptually evident affordance properties of the stimulus item (e.g., the key is jumping over the basket). The deleterious effects of providing even this type of nonmeaningful elaboration were evident.

It should be recalled, however, that Milgram (1968) did not find that nonsensical relations were less effective than meaningful relations. This discrepancy in data may well arise from the fact that Milgram's subjects generated their own relations. While a "bird eating a train" might be a nonsensical relation to the experimenter or another

child, for the individual creating the relation it might very well have been quite functional and "sensible," given the task circumstances. To the extent that the one example Milgram provides is representative of the subjects' production, their constructions appear at least to provide for subject-verb (or "affordance" compatibility), while all of the nonsense formulations provided in this study were constructed specifically to violate this coherence requirement.

With respect to this last point, however, it should be noted that Rohwer and Levin (1968) created anomolous sentences which were designed to violate verb-object agreement (e.g., Roses drink hats) rather than subject-verb agreement. As in the present study, the superiority of normal sentences was quite evident. The correct response level obtained by the nonretarded subjects tested by Rohwer and Levin (30%) was comparable to the 26% correct response level obtained by the EMR students in regular schools in the present study. The level obtained by the students in the special schools (2%) is much lower than would be expected. Such a finding emphasizes the particularly ineffective results derived from giving nonsensical material to children who might be characterized as more severely retarded.

The ineffectiveness of the Nonsense condition, in which the elaborations presented might be characterized as bizarre, would be considered at variance with recommendations by mnemonists that generating bizarre images generally benefits memory (cf. Lorayne & Lucas, 1974). The restriction of this finding to the more severely retarded or "defective" population might serve to relegate it to the gross explanatory category of "abnormal results from abnormal groups."

However, Odom-Brooks (Note 3) has recently reported that normal kindergarten children performed significantly poorer on an imagery task when given improbable "images." Thus, the finding, possibly restricted to experimenter generated bizarreness, has sufficient generality to warrant further investigation, especially since the mnemonic superiority of bizarre imagery has been questioned by recent research (cf. Postman, 1975, p. 322).

Within the four types of elaborations that contained a meaningful relation, there was no clear-cut finding as to the importance of either the type of relation or the familiarity of the relation. The dominant finding was the significant interaction between the two factors. In both the acquisition and reversal tasks, the ordering of the conditions was the same. The subjects in the Functional-familiar, and Positional-familiar conditions were characterized by relatively high performance levels, while the performance level in the Positional-unfamiliar condition was quite a bit lower. This finding was most evident in the acquisition task, and was found to be statistically significant there. Significant separation was not obtained in the reversal task.

As an independent factor, familiarity was not found to have straight-forward effects on elaborational effectiveness. At first, such a finding might lead one to question the validity of the emphasis frequently put on familiarity by educators (cf. Elliott, 1970). The interaction between type of relation and familiarity found in the present study, however, suggests that familiarity may become important when other circumstances are not optimal for promoting effective

learning. In other words, it appears that functional relations form an "optimal" condition for learning, and thus it does not matter whether the total event is one usually experienced or not. Based on the conceptualization underlying the establishment of functional relations, the hypothesis emerges that attribute-action congruency is a crucial element for establishing a basis for assimilating the object acted upon into the event structure. When optimal learning conditions do not exist, however, as has been posited to be the case for the positional relations, the effects of familiarity emerge. Thus, positional relations which were familiar resulted in a performance level approximately equal to that under optimal conditions. When the positional relations established were unfamiliar, however, the performance level dropped significantly. The present findings indicate that the familiarity variable may need to be incorporated into future research on elaboration efficacy. If the present findings are replicated, the present vaguaries regarding the status of the verb-preposition differences previously observed may be explicable. Other effects, previously masked by variations in elaborations within lists, which clearly contain uncontrolled instances of familiar or common events, uncommon events, anomolous events, and nonsense, may emerge with clarity. Of course, to the extent that the present findings are taken to confirm the importance of familiarity as a psychological variable, then, just as for previous researchers who similarly accepted the challenge of studying "novelty" as a variable, "We face the problem of measuring degree of novelty [read familiarity]," Berlyne, 1960, p. 22, (author — insert); certainly such measurement should be made with more precision

than was possible in the present study. That the measurement problem will be difficult is obvious, but it may be of more than applied or passing interest, and, indeed, solving it appears to be crucial for major progress in the "new look in memory" (cf. Jenkins, 1974), at least as this approach is exemplified in Craik's "levels of processing" theory. That is, Craik and Tulving have recently proposed that "an encoded unit is unitized or integrated on the basis of past experience, and ... is interpreted in terms of the system's structured record of past learning" (1975, p. 29, emphasis added).

Although the effect of relation type is somewhat obscured by the interaction of relation type and familiarity, the importance of providing some type of meaningful relation has previously been made clear. Most notable, of course, is the difference between the performance levels of children given only the labels for two items to be associated and those given paragraphs which provide a relation-based event involving the same two items (cf. Turnure, 1971; Turnure & Walsh, 1971). The importance of the existence of a relation in an elaboration, rather than the structural format of the elaboration, has been previously demonstrated (Turnure & Thurlow, 1973a; Turnure & Thurlow, 1975). It seems that the important factor is the degree to which the learning conditions cause the subject's awareness of the semantic relations between the paired-associates (cf. Turnure, Buium, & Thurlow, Note 4). One very effective way to influence such awareness is by arranging the items in a PA task so as to insure case relation compatability (Buium & Turnure, 1975). Some language theorists have taken extreme views on the importance of relational factors in verbal learning.

For example, Lenneberg (1973) has said, "Language is relational in every aspect and at every term. Hence to teach someone to speak is essentially to invite him to relate aspects of the environment in such and such a way (p. 6). Somewhat less extreme views are held by Donaldson and Wales (1970) who, following Peirce (1933), exempt proper nouns, one-place predicates, and some common nouns from a generalized relational interpretation of words. Moreover, Klaus F. Riegel (1970) further moderates this position when he argues, relativistically, for the "priority of relations over elements" (p. 224). Research inspired by relational theorists (cf. Asch, 1969; Asch & Ebenholz, 1962) has had an impact both in theory and in practice (Taylor, Thurlow & Turnure, Note 5; Thurlow, Taylor, & Turnure, Note 6).

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[1]Hereafter, the term "relations" or "relational" will be used in referring to semantic relations. For other types of relations (e.g., grammatical relations), the noun will always be qualified with the appropriate adjective.

Table 1

Means and Standard Deviations of Acquisition and Reversal Number Correct

	Regular School		Special School		Combined	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Functional-familiar						
Acquisition	7.8	1.6	6.6	4.0	7.2	2.9
Reversal	9.4	1.5	8.0	4.4	8.7	3.2
Functional-unfamiliar						
Acquisition	7.4	3.0	9.2	3.0	8.3	3.0
Reversal	9.2	2.6	10.4	1.8	9.8	2.2
Positional-familiar						
Acquisition	8.0	2.9	6.8	2.2	7.4	2.5
Reversal	10.2	1.3	8.6	1.1	9.4	1.4
Positional-unfamiliar						
Acquisition	3.6	2.4	4.0	2.0	3.8	2.5
Reversal	6.4	3.6	6.4	4.5	6.4	8.9
Nonsense						
Acquisition	3.2	1.9	0.2	0.4	1.7	2.0
Reversal	5.0	2.0	2.0	2.0	3.5	2.5